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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Gonzalez *et al.*

Confirmation No.: 1937

Serial No.: 09/805,353

Art Unit: 1639

Filed: March 13, 2001

Examiner: T.H.F. Friend

For: ENGINEERED PROTEIN  
BINDING DOMAINS AND  
METHODS AND SYSTEMS  
FOR THEIR DESIGN AND USE

Attorney Docket No:  
9882-015-999

TECH CENTER 1600/2900

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**RESPONSE TO RESTRICTION REQUIREMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

In response to the Office Action mailed May 13, 2003, please enter this Response and consider the remarks below. Also submitted is a Petition for the Extension of Time for one month from June 13, 2003 until and including July 13, 2001. No fee is believed necessary to be paid with this response; please charge any fee deemed necessary, including any fees for time extensions not otherwise provided for, or credit any overpayment to, Pennie & Edmonds deposit account no. 16-1150.

In the following, the Applicants:

- (1) Elect the invention to be examined;
- (2) Traverse the restriction requirement; and
- (3) Request transfer to an art unit or technology center appropriate for the examination of computer methods and systems.

**ELECTION OF THE INVENTION TO BE EXAMINED**

In the Office Action mailed May 13, 2003, the Examiner has required restriction to one of the following inventions:

**Group I.<sup>1</sup>** Claims 1-10 and 122, drawn to a method of engineering one or more binding macromolecules, classified in one of class 435, and one of numerous subclasses, depending on the target, method of screening, and macromolecule.

**Group II.<sup>2</sup>** Claims 11-44 and 123-127, drawn to a method of engineering one or more binding polypeptides, classified in class 435, and one of numerous subclasses depending on the target and method of screening.

**Group III.** Claims 45-56, 128, and 129, drawn to a computer system and computer-readable medium, classified in class 700, subclass 90.

**Group IV.** Claims 57-65 and 130, drawn to a polypeptide and associated vector and cell, classified in class 530, subclass and one of numerous subclasses, depending on the polypeptide.

**Group V.** Claims 66 and 68-70, drawn to a method for altering the function of a cellular protein, classified in class 435, subclass 455.

**Group VI.** Claim 67, drawn to a cell comprising a nucleic acid encoding an altered cellular protein, classified in class 435, and one of numerous subclasses, depending on the type of cell.

**Group VII.** Claim 71, drawn to a cell comprising a cellular protein with altered function, classified in class 435, one of numerous subclasses, depending on the type of cell.

**Group VIII.** Claims 72-76 and 131, drawn to a method for assaying for one or more target polypeptides in a sample, classified in class 436, subclass 501.

**Group IX.** Claims 77-80, drawn to a method of determining the cellular localization of a target protein, classified in class 436, subclass 86.

**Group X.** Claims 81-89, drawn to a method for assaying for target proteins in a sample from an organism, classified in class 435, digest 15.

**Group XI.** Claims 90-101, drawn to a library comprising recombinant organisms, classified in class 435, digest 23.

**Group XII.** Claims 102-113, 132, and 133, drawn to a polypeptide array, classified in class 435, digest 35.

**Group XIII.** Claims 114-117, drawn to a polypeptide-RNA fusion array, classified in class 435, digest 36.

**Group XIV.** Claims 118-121, drawn to a method of purifying one or more selected proteins from a sample, classified in class 530, subclass 810.

Further, if one of Groups I, II, IV-XIV is elected, the Examiner has further required an election of species. On the other hand, no further election of species has been required if Group III is selected.

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<sup>1</sup> Although the Office Action stated that Group I included claims 1-9 and 122 and Group II claims 10-44 and 123-127, it is submitted that Group I and Group II are correctly set out as above, where claim 10 belongs to Group I and not to Group II. This is because claim 9 is dependent on claim 1.

<sup>2</sup> Claim 10 is dependent from claim 1 and properly belongs in Group I.

In response, the Applicants elect for prosecution in this application the claims of Group III, namely claims 45-56, 128, and 129, drawn to a computer system and computer-readable medium. This election is believed to be fully responsive, no election of species having been required for the elected group.

#### **TRANSVERSAL OF THE RESTRICTION REQUIREMENT**

The pending restriction requirement and election of species is traversed at least with respect to Groups I-III and also with respect to Groups I-IX and XIV, because the inventions claimed by the claims of these groups, when properly read in light of the specification, are neither independent nor distinct. The claims of Groups I-III are all directed to either computer-implemented methods or to corresponding computer apparatus suitable only for practicing the methods. Further, the claims of Groups IV-IX and XIV all incorporate directly or indirectly these computer methods and apparatus.

Turning first to the independent claims of Groups I and II, namely claims 1, 11, 122, 123, and 127, as properly-interpreted these claims actually recite computer-implemented "methods of engineering". They do not recite any laboratory or experimental steps. In detail, the steps of these claims are all carried out by differing combinations of "rational engineering methods", or "rational methods", or "computer-assisted molecular design (CAMD) methods", and the like. They include screening steps where binding is not actually measured, but is "estimated" or is "estimated by rational methods".

To properly interpret these limitations the specification must be consulted, because it is well understood that even for the purposes of classification and restriction, claims and claim elements are to be read in the light of the specification of which they are a part<sup>3</sup> In this regard, the specification speaks clearly and unequivocally that "rational methods" and the like mean computer-based methods and computer-implemented techniques. For example, the specification states the following.

Briefly, "rational design" principles derive from physical and chemical principles that are used in approximate form in computer-based modeling, or from databases of known protein structures that are used in homology modeling, sequence alignment, and the like, or from empirical rules derived from examples of polypeptide-ligand binding known in the art, or from common chemical knowledge (such rules also including tables of amino acid

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<sup>3</sup> See, for example, M.P.E.P. § 903.08(e)(C) (The claims and statement of invention are generally taken as they read; however, claims must be read in light of the disclosure (claimed disclosure)).

properties, such as indices of hydrophobicity), or so forth. . . . Rational design does not include laboratory techniques, such as random mutagenesis, which are unguided by *a priori* principles, or knowledge, or rules. . . . Rational design/selection is often performed by computer-implemented methods (otherwise known in the art as *in silico* methods) operating on data representing the precursor domain or the candidate domains to the extent possible and reasonable for a particular engineering problem.<sup>4</sup>

These independent claims, thus, do not encompass *in vivo* or *in vitro* methods; properly interpreted then recite only *in silico* methods. Moreover, upon comparing the independent claims of Groups I and II with those of Group III, it will be appreciated that the claims of this latter group recite computer apparatus having software suitable only for carrying out the claims of the former group.

Additionally, because the claims of Groups I and II recite computer-implemented methods and the claims of Group III recite the corresponding computer apparatus, the claims of all these groups should be similarly classified in a computer-related subject matter group, such as Group 700.<sup>5</sup> Group 435 is, on the other hand, only for *in vivo* or *in vitro* related subject matter, and is not at all related to the *in silico* subject matter of these claims.<sup>6</sup> It is respectfully submitted that Group 435 is inappropriate for the claims of these groups.

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<sup>4</sup> Specification, page 20, lines 6-26; see also specification at page 5, lines 7-29.

<sup>5</sup> Group 700 is for certain computer apparatus and corresponding methods. Its definition, states in part:

This is the generic class for the combination of a data processing or calculating computer apparatus (or corresponding methods for performing data processing or calculating operations) AND a device or apparatus controlled thereby, the entirety hereinafter referred to as a "control system".

Classification Definitions, Class 700, page 700-1 (emphasis added). However, the Applicants note that their invention would not routinely be considered a "control system", and here propose Class 700 chosen by the Examiner for Group III only as more suitable than the classes chosen for the other groups.

<sup>6</sup> Group 435 is for subject matter such as the following:

- A. A process of using a microorganism or enzyme to synthesize a chemical product.
- B. A process of treating a material with a microorganism or enzyme to separate, liberate, or purify a preexisting substance.
- C. An *in vitro* process of measuring and testing in which: (1) A microorganism or enzyme is used to determine the presence or identity of a compound or composition in a sample; (2) A microorganism is identified by propagation; (3) An enzyme is identified by its catalytic activity; (4) The presence of microorganisms is detected; (5) A live microorganism is used in an antigen antibody test as an antigen; (6) Fixed or stabilized non-living microorganisms, cells, or tissues are involved.

Classification Definitions, Class 435, page 435-1.



Therefore, the pending restriction requirement should be withdrawn with respect to Groups I-III because these claims are not independent. Further they are not distinct, because the recited methods can only be practiced by the recited apparatus that is in turn suitable for no other purpose.<sup>7</sup> The claimed methods are of a complexity requiring computer implementation by software implementing the method steps; and the claimed apparatus comprising software implementing the method steps can only practice the claimed methods. Also, there is no reason for restriction because these groups are related: they should be similarly classified; they have a single status in the art; and they can be searched together.<sup>8</sup>

Turning finally to the claims of Groups IV-IX and XIV, the pending restriction should also be withdrawn with respect to these groups for the same reasons as apply to Groups I-III, because the former groups all incorporate directly or indirectly the computer methods and apparatus recited by the latter groups. In particular, the claims of Groups IV, V, VIII, IX, and XIV all recite embodiments which explicitly incorporate the computer-implemented steps of claims of Groups I and II. For example, independent claim 57 of Group IV incorporates the steps of claim 11 of Group II as follows.

57. A polypeptide for binding to a selected target polypeptide engineered according to the method of claim 11.

Further, the claims of Groups VI and VII indirectly incorporate the computer-implemented steps of the claims of Groups I and II by explicitly incorporating the steps of claims of Group V. For example, independent claim 67 of Group VI incorporates the steps of claim 66 of Group V as follows.

67. A cell comprising a nucleic acid encoding a cellular protein altered according to claim 66.

In conclusion, the pending restriction requirement should be withdrawn with respect to the claims of Groups I-IX and XIV, because these groups recite inventions that are neither independent nor distinct, and that furthermore can be compactly prosecuted together without burden to the Examiner.

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<sup>7</sup> See, for example, M.P.E.P. § 806.05(e).

<sup>8</sup> See, for example, M.P.E.P. § 808.02.

## **REQUEST FOR TRANSFER OF THIS APPLICATION**

After entry of the present response to the pending restriction requirement, only claims 45-56, 128, and 129 of Group III drawn to a computer system and computer-readable medium are for examination. No claims currently classified in classes 435, 436, and 530, and that are thereby contended in the outstanding Office Action to be primarily directed to biotechnology and organic chemistry subject matter, have been elected for examination. Accordingly, it is respectfully requested that this application be transferred to an art unit or technology group directed to the examination of, specifically, computer software for protein modeling, or, more generally, to the examination of computer software applied in chemistry or biotechnology, or at least, to the examination of computer software generally.

It is noted that Office practice is to immediately inspect amendments, and if the amendment makes transfer proper, to promptly take the necessary steps.<sup>9</sup> Also, it is noted even though an examiner in an art unit appropriate for examination of certain claims has acted on a pending application by making a restriction requirement, the applicant's response to the requirement may necessitate transfer of the application if the elected claims are best examinable in another art unit.<sup>10</sup>

It is submitted that this application for all the reasons above is such an application requiring transfer after response to a restriction requirement according to "best examinable" practice. Therefore, transfer is requested to an art unit directed to computer software, which may be an art unit within Technology Center 1600 (for example, a bioinformatics art unit) or to an art unit within another technology center (for example, Technology Center 2100).

## **CONCLUSIONS**

The Applicants respectfully request entry of the foregoing response and remarks into the file of the above-captioned application. The Applicants believe that the pending restriction requirement has been fully complied with and effectively traversed. Reconsideration and withdrawal of this requirement is earnestly requested, as is the transfer of this application to an art unit or technology center for the examination of computer-related subject matter.

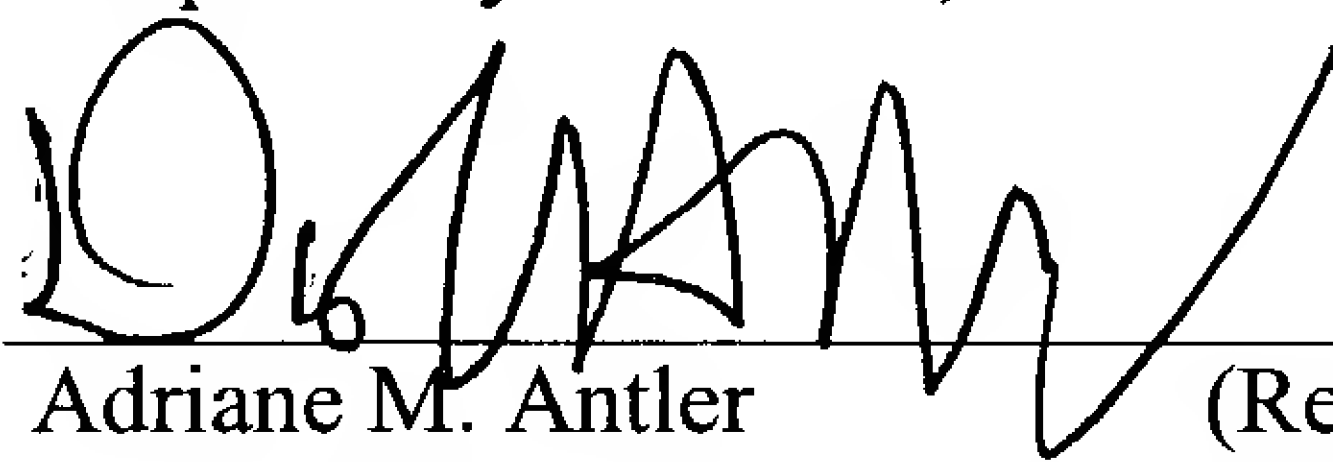
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<sup>9</sup> See, for example, M.P.E.P. § 903.08(c).

<sup>10</sup> See, for example, M.P.E.P. § 903.08(f)(I).

If any outstanding issues remain, the Examiner is invited to telephone the undersigned to discuss the same and to arrange for prompt and efficient handling of the above-captioned application.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "D. H. Renfrew Jr.", written over a horizontal line.

Date July 9, 2003

Adriane M. Antler (Reg. No. 32,605)

By: Dwight H. Renfrew Jr. (Reg. No. 38,594)

PENNIE & EDMONDS LLP

1155 Avenue of the Americas

New York, NY 10036

(212) 790-9090